

Animating Material Assignments

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Animating specific material assignments opens the door to new ways to present information both internally and to clients. The process is straightforward, the results impressive.

The ability to animate specific elements in a visualization is known to most users, but less understood is the ability to animate specific material assignments. Follow along using the sample file in the Visualization project, Office2.dgn.

Figure 1 shows office2.dgn rendered; Figure 2 shows a wireframe view.

This exercise will cover how to change one of the PC screens in the drawing into a TV set; the screen image will become animated.

The first item of business is to create a new image for the PC screen. To animate the material on the PC monitor it is first necessary to save an image sequence.

For this example, I converted a file called Sydney.avi, as supplied on the ShowCase II CD, into a series of TIF files, using Adobe Premiere 6 (see Figure 3). These files are numbered incrementally; the material animator will expect to find them this way (see Figure 3).

Using the first of the TIF files, I created a new Palette and material. This prevents the possibility of inadvertently changing anything related to the default workspace, which may be needed later.

I opened the Define Materials dialog, selecting Settings > Rendering > Define Materials. (see Figure 3)

I named the material "TV," then turned on Base Color and Specular Color, leaving them set as white. This stops the images altering to the color of the element they are assigned to. The next step was to turn Cast Shadows off (this is a personal preference, not an important step). I then selected the initial image using the Select button in the lower right corner of the dialog (Figure 5). Due to the way materials are assigned in

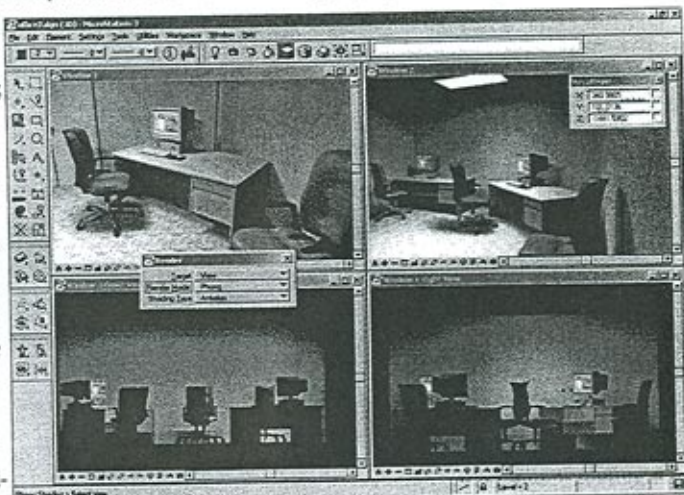


Figure 1: Office2.dgn rendered.

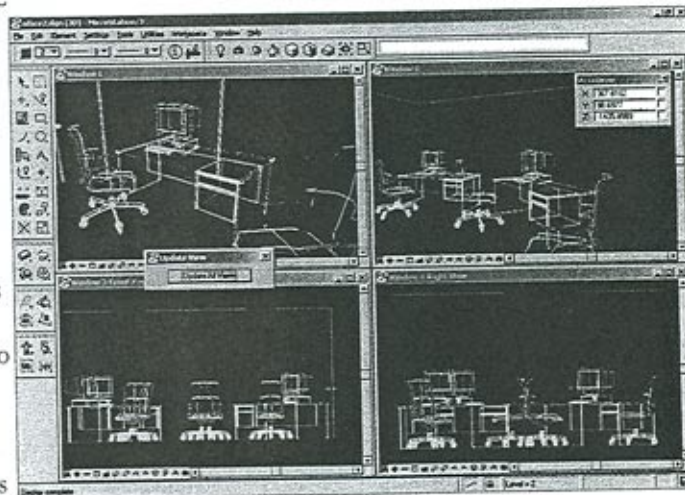


Figure 2: Office2.dgn in wireframe view.

sydney0001.tif	sydney0027.tif
sydney0002.tif	sydney0028.tif
sydney0003.tif	sydney0029.tif
sydney0004.tif	sydney0030.tif
sydney0005.tif	sydney0031.tif
sydney0006.tif	sydney0032.tif
sydney0007.tif	sydney0033.tif
sydney0008.tif	sydney0034.tif
sydney0009.tif	sydney0035.tif
sydney0010.tif	sydney0036.tif
sydney0011.tif	sydney0037.tif
sydney0012.tif	sydney0038.tif
sydney0013.tif	sydney0039.tif
sydney0014.tif	sydney0040.tif
sydney0015.tif	sydney0041.tif

Figure 3: List of .TIF files converted from .AVI format.

MicroStation, I selected the Flip option.

Finally, I clicked the Add button and then used File > Save Palette As to call the palette TV (Figure 6).

For the next step, I zoomed up on one of the PC Screens.

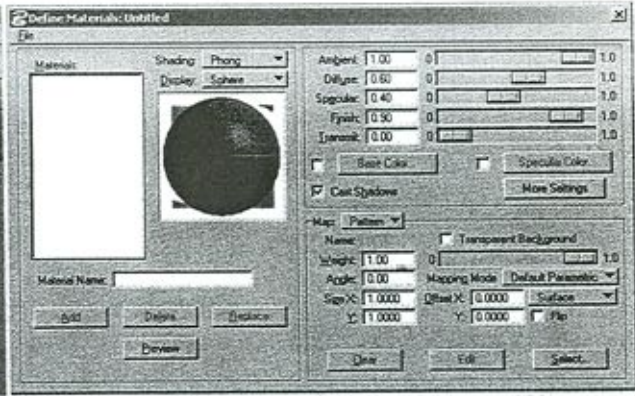


Figure 4: Opening and using the Define Materials dialog.

The Assign Materials tool is now used to assign the newly created material (TV) to one of the PC screens. I selected the Open button and double-clicked the TV.pal entry. Due to the TV material being the only material in the palette, it is selected by default. To assign this material to an element, click to select the element and then click to accept the assignment.

In this example, it is important to be sure the highlighted element is the screen of the monitor (represented by a green rectangle) and not the casing of the monitor.

Next, I expanded Window 2 to Full Screen and zoomed in on the chair and PC (Figure 7). This allowed for easy manipulation and creation of the scene.

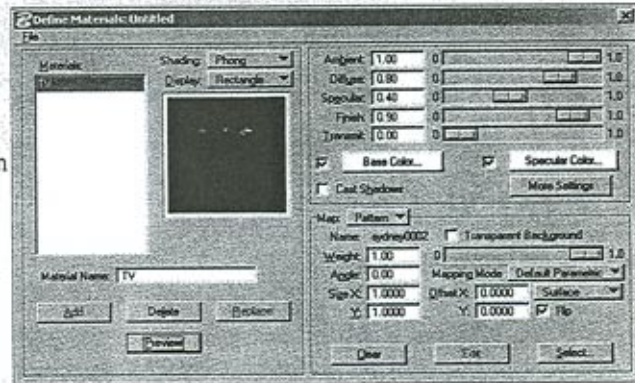


Figure 5: Save the new palette.

I opened Window 5 (Window > Open/Close > 5). This window will be the camera window and will be setup to run the animation. If you are working along with me, right now would be a good time to make sure AccuDraw is active.

Expand Window 5 to Full Screen and select the Camera Settings tool. You'll find this tool in the 3D View Control toolbox.

Following the tool prompts, first click a data point in View 5. From the Window menu select Window > Window 2 to bring Window 2 to the foreground (Figures 8 and 9).

Using AccuDraw or Center Snap obtain the center of the monitor screen (green rectangle) as the camera target point (Figure 10).

To define the camera position, snap to the top of the chair and press "O" for AccuDraw to move its origin to that point. Set the AccuDraw compass rotation to Front View ("F" on the keyboard) and slide the pointer along the AccuDraw axis directed towards the PC screen. When you have roughly gauged a position where the viewpoint should be, click the data button. Bring Window 5 back to the foreground (Window > Window 5, Figure 11).

Next, Zoom out Window 5 with a factor of 1.25 and using the scroll bars to position the scene for a better shot.

Now that you have the scene and the materials set, the animation sequence can be created. Material Animation is not enough to

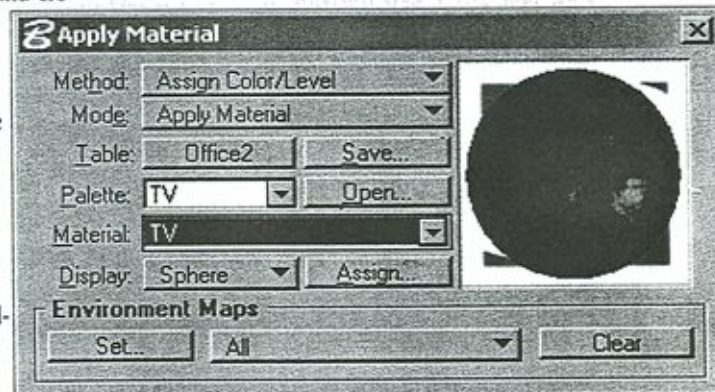


Figure 6: Accept the material.

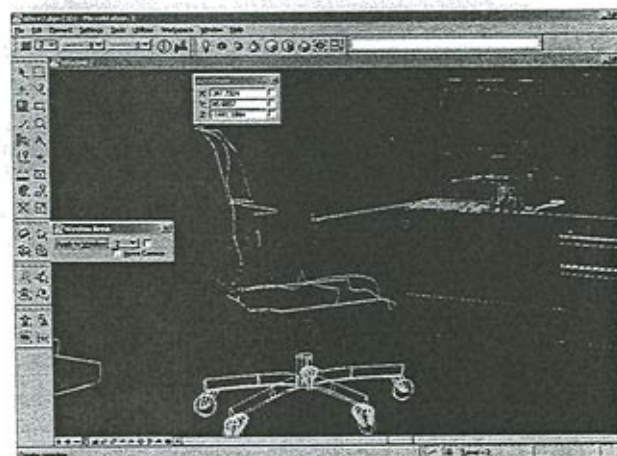


Figure 7: Setting the scene for the rendering shot.

warrant its own animation—the material animation is stretched over the length of the animation of elements—so some elements must be animated.

To satisfy the above, a simple rectangle, turned into an actor with a straight-line path, will be used.

Bring Window 3 to the foreground (Window > Window 3) (Figure 12). Draw a small rectangle above the office elements and then draw a line leading from the rectangle for a short distance.

Create an actor out of the rectangle using the default settings. Select the CREATE ACTOR tool from the ANIMATION ACTORS toolbar (Figure 13).

Enter a value in the Name: field (Figure 14).

Select and accept the rectangle as drawn earlier.

Telling the rectangle to follow the line is simple; select the Define Actor Path tool from the Animation Actors toolbar (Figure 15).

Double-click on the actor name as entered previously, snap to the end of the line (on the end farthest from the rectangle) and accept. The Define Actor Path dialog appears; all that needs to be done here (for this situation) is to set the End Frame: value to "100" (Figure 16).

To animate the material settings, click the Animate Material Settings tool in the Animation Settings toolbox (Figure 17). Select TV from the material list and change the Setting to Pattern Map Increment.

The Frame Number can be left at zero (the material animation will start at the beginning of the animation) and the Pattern Map Increment changed to 5. The pattern will cycle through the .TIF files, incrementing the file number by 5 for each frame. The reason for this is Sydney.avi is 294 seconds, and the 100 frames created in this example will make the movie approximately three seconds long.

If an increment value of one is used, an animated background will play at the same speed as the input sequence. Values less than one will play slower, and values greater than one will play faster (and skip some frames in the input sequence). Increment values below zero cause the input sequence to play backwards.

Select and accept the green rectangle that represents the screen in Window 5.

Opening the Animation Producer dialog (Utilities > Render > Animation) shows the actor and the material animation (Figure 18).

To see the results of the animation sequence select File > Record Script from the Animation Producer dialog (Figure 19).

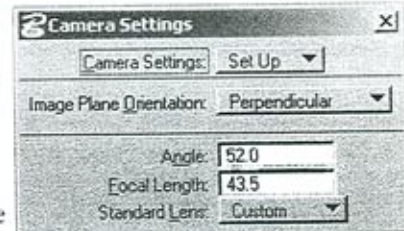


Figure 8: Camera Settings dialog.



Figure 9: Select Window

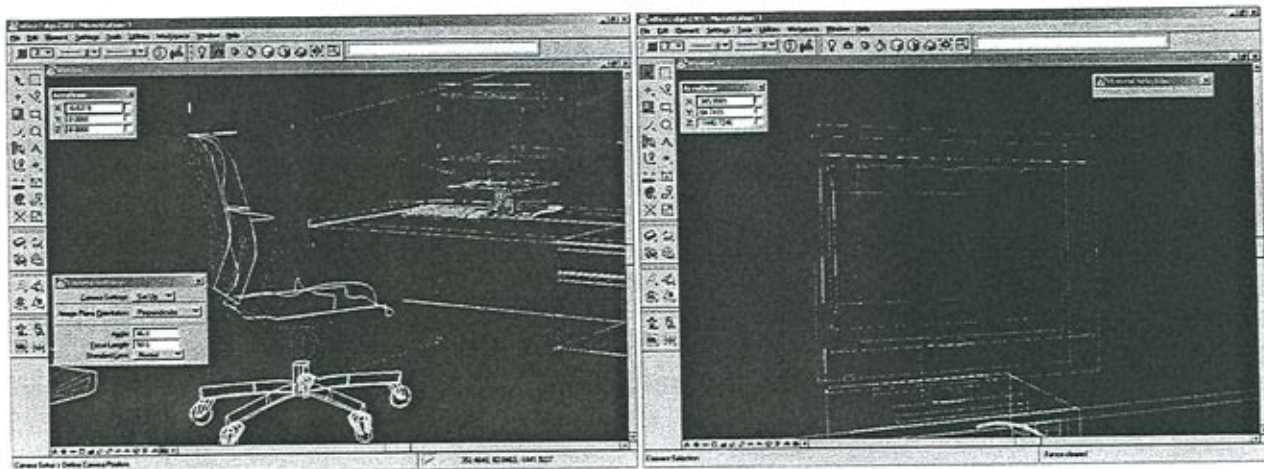


Figure 10: Using AccuDraw to position the camera and the resulting view.

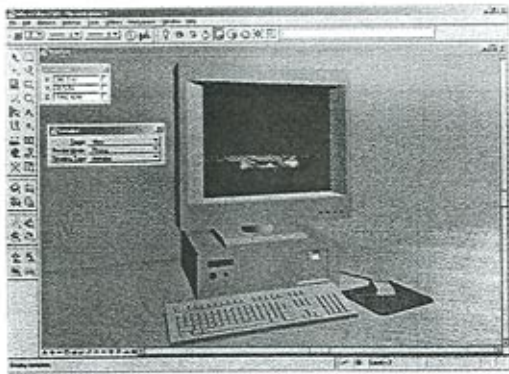


Figure 11: View manipulated for a nicer scene, showing new TV material, on the PC Screen.

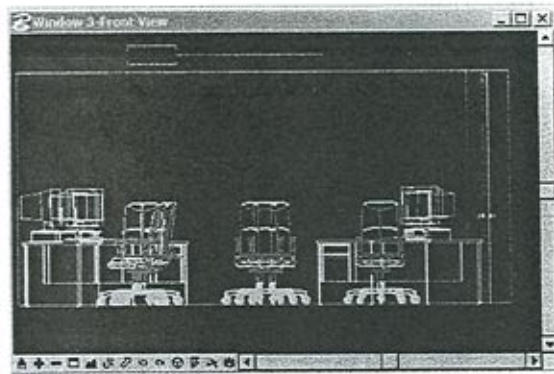


Figure 12: Using a rectangle as an actor

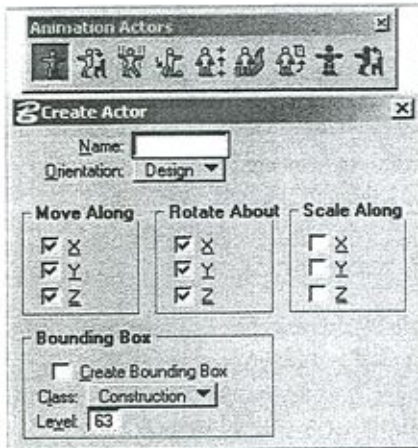


Figure 13: Create Actor toolbar and dialog.

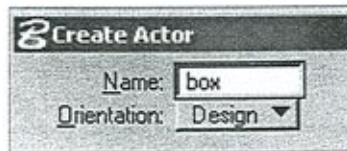


Figure 14: Create Actor name field.



Figure 15: Define Actor Path toolbar and dialog.

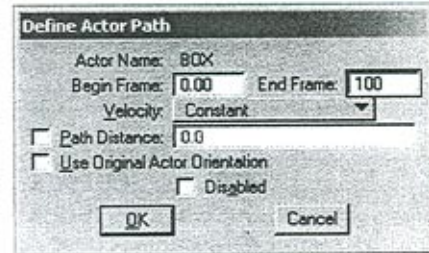


Figure 16: Enter "100" as the End Frame value.

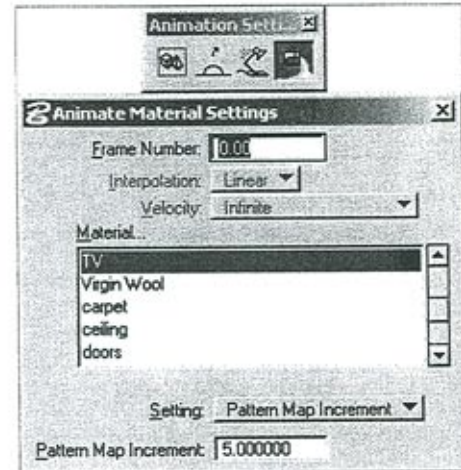


Figure 17: Animate Material Settings toolbar and dialog

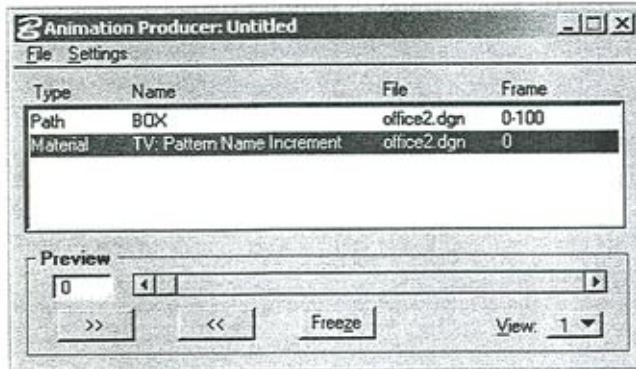


Figure 18: Animation Producer dialog.

Be sure to set the View to 5 and have Clear Pattern/Bump Maps Between Frames checked ON. Failing to switch the latter option to ON will cause all the materials used by the animation (100 .TIF files) to be loaded into RAM. Allowing this process to occur would greatly increase the processing time to create the final animation file and may cause the PC to quickly run out of available memory. When finished, locate the .AVI file just created and play it back to view the results.

This example is meant to encourage you to try greater things. The process could be used to show clients the changes in paint/brick color of a building, to gauge the reflective attributes of different materials in given light settings or to see what color you would like your roof painted this year.

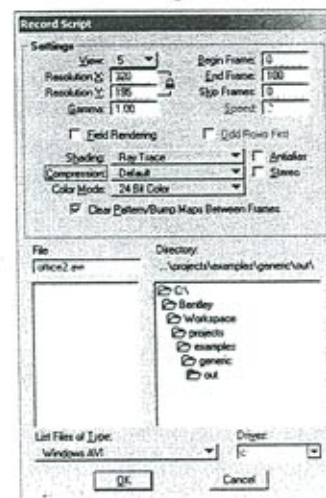


Figure 19: Record Script dialog.